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COMMITTEE ON FORESTS

Co-operation in Forestry

By

B. E. FERNOW, LL.D.

Dean, Faculty of Forestry, University of Toronto

Reprinted from the Sixth Annual Report of the  
Commission of Conservation

OTTAWA—1915









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## Co-operation in Forestry

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THE present time is not very opportune to suggest work and expenditures which are not immediately urgent, and which can be deferred to the future without creating distress. And, I take it, most of the aims and objects of the Commission have to deal more with the needs of the future than with those of the present ; and are, therefore, of a kind that can be delayed. Yet, may we not with propriety reverse the well-known advice and say : In time of war prepare for peace. So might we emulate the brilliant example of the patriotic Dutch who, in the midst of the distress and misery of their war of liberation, more than 300 years ago, when the choice was given them, preferred to establish universities rather than to accept release from taxation, exhibiting in this the most sublime patriotism.

There are two or three suggestions in the Chairman's review of the work of the Committee on Forests which may be accentuated ; two or three directions in which progress could be made for the improvement of forestry conditions in the country even now, without any, or at least with little additional expenditure—indeed, with greater efficiency and economy as a result, by merely re-arranging matters. One suggestion refers to a re-organization of the administrative offices dealing with the Crown timber-lands of the Dominion. Another refers to an expansion of the scientific work of the Dominion Forestry Branch as a basis for future forest management. The third refers to an arrangement by which the Trent watershed, or portions of it, may come under the administration of the Dominion.

**Re-organization  
Essential**

You have heard of the incongruous condition which prevails now in the administration of the public timber-lands. Three separate and independently organized government Branches divide authority over them. There is the Timber Branch, which is in charge of the licensed timber limits ; the Forestry Branch, in charge of forest reservations, curtailed, however, by the timber limits within the reservations which had been licensed before the reservations were made ; and the Parks Branch, which has charge of still other portions of the timber area. Each of these Branches works without any organic relation to the



other, and in some cases exercising functions and dividing authority over one and the same territory. Anybody with experience in business organization will admit that this is not good business.

The Forestry Branch, a creation of the Chairman of this Commission when he was Minister of the Interior, was presumably instituted to bring into the administration, technical knowledge which was to be utilized to insure continuity of our timber resources, in so far as the Dominion controls them. Yet all, or nearly all, the timberlands which can be utilized for the next 50 years are, under the licenses in operation, withdrawn from its direct influence, indeed are being cut over without technical supervision and are gradually being added to the mismanaged lands which will be the burden of the future.

For the Parks Branch, it may be said that the lands set aside and placed under its management are to serve a different object from the economic one of furnishing timber supplies, and hence a different management is required. Yet, there is no valid reason why the different objects could not be attained under one and the same administrative agency. Indeed, it would be possible to devise a management which would serve both park and economic interests.

**Where Present System Fails**      The lands in this case, however, are territorially differentiated, and hence can be separately administered without much friction ; only occasionally the fact that they are under a different Branch brings inconvenience, and interferes with a uniform and economic development. But in the case of the commercial timber areas the division of authority between Timber Branch and Forestry Branch frequently leads to friction and uneconomic procedures, because the divided authority often covers the same area, namely, whenever timber limits are included in a forest reserve. This is the case with most limits in Alberta and with many elsewhere. Here, the Forestry Branch is charged with the duty of protection against fire and trespass for the timber limits themselves, as well as outside them, but has no right to interfere with limit-holders, who may be liable to trespass, or who may be responsible for fires by neglecting the prescribed conditions of logging and brush disposal. While the conditions of the timber licenses, as to cutting to a diameter limit, as to complete utilization, as to leaving the ground in good condition, including the possibility of brush disposal, are well taken care of on *paper*, the personnel of the Timber Branch being essentially composed of office men, these conditions are most frequently not enforced in the *field*.

In the territorially segregated timber limits outside the forest reservations this neglect is perhaps of little consequence, because



these lands will, for the most part, eventually be turned to agricultural use ; but those lying within the reservations become danger spots, and a handicap to the Forestry Branch in its efforts to develop a proper system of protection and better silvicultural practice.

**Definite  
Changes  
Suggested**

A rational arrangement which can be effected without much upheaval would be to place the administration of these timber limits, within the reservations at least, wholly under the Forestry Branch. There will then be a territorial subdivision of authority which will obviate the antagonisms between different policies.

In this connection the question of personnel is all-important. It will never be possible to develop a technically sound administration through political appointees. Every effort should be made to build up an organization of competent, active, *trained* men, trained for the different duties of the field work, and made permanent under civil service rules. The higher grade officials, who can secure their training at the forest schools, will have to be used as instructors in technical knowledge in order to provide short courses for the rangers who may have found entrance to the service by passing an entirely practical examination for ranger work, but are later expected to execute technical prescriptions. The main point is to make the service independent of political changes, for in forestry work, more than in any other business, persistence and permanence are essential requisites.

With such an organization and extension of the functions of the Forestry Branch in the practical field, the opportunity for systematic study and investigation of the problems of silviculture becomes possible. We are still lacking in Canada the most fundamental knowledge of the biology of our tree species upon which their silviculture is based. We are lacking volume tables as aids to timber estimating, and yield tables as a basis for calculating the results of our silviculture ; all of which the Forestry Branch will then be equipped to furnish. It will then also be in a position to do necessary experimental work and to establish demonstrations as to proper procedure in the field, by organizing systematic management of forest areas.

**Object Lessons  
in Trent  
Watershed**

One of these demonstrations, an object lesson of wide usefulness to the people of the Eastern provinces, could be made in the Trent watershed, to show how a mismanaged tract may be recuperated and become productive again. I shall not repeat the arguments advanced in the report on the "Trent Watershed Survey" as to why the Dominion Government should undertake the management of this tract. In the report, it is suggested that the Dominion either purchase the necessary area, or

else secure it free of immediate charge, under some financial arrangement with the province of Ontario. Under present circumstances the latter method will recommend itself, the *quid pro quo* to the province to consist of financial returns when the property begins to bring a revenue.

To make the matter clear, especially in its financial aspects, I may be allowed to present a tentative plan of procedure as an example. Assume that at least 100,000 acres be taken under operation. This the province is now under agreement to sell to the Dominion at 50 cents per acre. The province may prefer not to part with the land, but instead permit its use under lease for demonstration purposes free of charge, provided that eventual profits from the management, above a certain amount, be turned into her treasury.

We may assume that one-half the area contains natural growth, which, if protected against fire, and properly treated by thinnings, will grow into value, and that the other half requires artificial planting. The 100,000 acres referred to above could be selected to represent these two conditions. We have then 50,000 acres growing naturally and 50,000 acres to plant.

To place the property in shape for management and provide it with a good system of fire protection and permanent improvements, such as surveys, roads, trails, watch-towers, telephone lines, ranger houses, may be calculated to require an expenditure of \$10,000 during the first few years. A manager and five rangers would make an ample personnel, requiring an annual outlay of, say, \$6,000. The 50,000 acres, to be planted in a 50-year campaign, 1,000 acres annually, would require an annual outlay for 50 years of, say, \$6,000. Add to this an annual outlay of \$3,000 for improvement of the other 50,000 acres, and it will bring the annual charge to \$15,000.

The summing up of these quite generous initial and annual expenditures will make the cost of the property 50 years hence, with three per cent compound interest, \$1,750,000 in round numbers. Let us now look at the credit side. Long before the end of the 50-year period, the 50,000 acres of natural growth will have begun to furnish saleable material. A live manager will, indeed, find that right from the start he can secure values which will, in part, cover expenditures. But to be conservative, we may assume that only after 25 years of improvements, on an average 1,000 acres annually may be cut, yielding at a minimum five million feet B.M., which, figured even at present prices—and these are bound to improve—would net \$50,000. These \$50,000 incomes, at three per cent will have accumulated for the 25 years up to the fiftieth year to around \$1,800,000. In other words, before the 50-year period has expired the entire transaction will have



paid for itself with three per cent compound interest. Any reasonable demand of the province can then be satisfied, and there will be left 25,000 acres of improved natural growth, capable of furnishing a revenue of at least \$50,000 per year, and 50,000 acres of plantations from one to 50 years old, which when ready for the axe, say 20 or 30 years later, when the first crop is fit for cutting, may be expected to furnish additional income from the stumpage of 1,000 acres each year, of, say, at least \$300,000, pointing to a capital value of the property of \$10,000,000 which we have built up during the 70 to 80 years by an expenditure of less than \$2,000,000. This figure is arrived at, after making allowance for failures and losses and by assuming no changes in lumber values.\* It would not be surprising if twice the amount could be secured by that time.†

**What Has  
Been Done  
in France**

That these figures are not fancies but reasonable possibilities will be admitted by every forester. Moreover, we have most convincing and illuminating evidence from France that such astonishing results have been actually attained. While the figures reached in France may not be attainable by us, due to difference in labour and market conditions, the relative results show such margins that we can at least expect to make a promising approach to them.

Let me briefly cite these experiences. In the first half of the nineteenth century up to 1865, the State Forest Department planted 200,000 acres of sand dunes and placed them under management at a total expense of \$2,700,000 or \$13.50 per acre. A little less than half the area was then ceded to municipalities and private owners for \$2,745,000, therefore paying fully for the outlay, and the remaining 125,000 acres are valued at \$10,000,000. In 1901, the first cutting was made and yielded \$92 per acre from a property that had cost nothing.

**Improvements  
Carried Out**

The improvement by ditching and planting of the adjoining *Landes*, nearly 2,000,000 acres, was begun in 1837, by private interests, who, by 1857, had reclaimed 50,000 acres. Then the Government stepped in with a

\* To give an idea of the rise of stumpage values in the past we may refer to the experience of Ezra Cornell, who selected timber-lands in Wisconsin for the "foundation" of Cornell University. In 1866, he paid 60 cents per acre, or five to ten cents per thousand feet B.M. Of the 500,000 acres thus bought, one-fifth was sold for \$4 per acre, or 30 to 40 cents per thousand feet in 1873, and, by 1905, practically all the land had been sold, the last prices ranging from \$10 to \$12 per thousand. Now, white pine stumpage in Wisconsin brings \$20, and as high as \$65 has been paid for selected trees.

The poorest kind of material for box boards in New England, some as small as two inches and lengths of three to four feet, brings \$14 to \$18 per thousand f.o.b., while better grades of second growth bring \$25 to \$35 for round-edged boards.

† It must be understood that the above figures are merely tentative and could be considerably altered; yet the final result would not change in character: a decidedly paying investment.



broad-gauge plan, building roads, railways, drainage systems, making planting plans free of charge and assisting the municipalities in reclaiming the land. The State itself bought some 390,000 acres of land to enable the municipalities to accomplish the improvements. This once poverty-stricken district, which a century ago was hardly inhabited is now traversed by the densest net of railways in France.

By 1907, with an expenditure of around \$10,500,000 (\$6.50 per acre) 1,600,000 acres were reclaimed, 85 per cent in forest, of which the State owns somewhat over 100,000 acres, municipalities 185,000 acres and private owners the bulk of 1,500,000 acres. In 1898, the value of these holdings, created from nothing, was estimated at over \$96,000,000. In 1892, the average net yield was \$2.40 per acre, and since then it has been rising, so that, now, an annual income of \$8,000,000 is the result ; this from an expenditure of \$10,000,000.

The third region of extensive waste land planting is that of the Sologne near Orleans, a sandy, poorly drained plain on an impermeable calcareous subsoil, giving rise to swamps. This was once densely wooded, but, by the end of the eighteenth century, some million and a quarter acres had been devastated fully as much as our Ontario territory, and had been abandoned. A committee of private citizens undertook its reclamation, and some 200,000 acres were planted at five dollars per acre. An estimate of the value of these plantations places it at \$18,000,000, so that lands which 50 years ago could hardly be sold for four dollars per acre now bring over three dollars as an annual revenue.

The fourth district lies on the arid limestone wastes in the province of Champagne. Here, since 1830, by private enterprise over 200,000 acres were planted and prepared for management at a cost of less than ten dollars an acre. The present stumpage value is figured at from \$50 to \$100 per acre, and, yielding two dollars per acre revenue, this property is estimated at \$10,000,000.

France has, therefore, altogether 2,000,000 acres, recuperated by an expenditure of less than 15 million dollars, to now represent a capital of 135 million dollars, or nine times the outlay, and an income of around ten million dollars, or, say, seven per cent on the valuation.

#### Results in America

To assure you that on this continent similar results have already been obtained, I may cite from an official bulletin of the United States Forest Service,\* giving full details respecting the production of second growth white pine in New Hampshire and New England generally. The

\* *The Timber Pines of the Southern United States*; Bulletin No. 13, U.S. Dept. of Agriculture, Division of Forestry, 1897.



bulletin shows that such growth on third quality soil produces in 80 years, 8,820 cubic feet, equivalent to 50,000 feet B.M., and on best quality soils, more than 50 per cent more, while we have assumed in our calculations only 30,000 feet as a conservative figure.

Stumpage values actually obtained for the inferior second growth vary here from \$4.73 to \$8.48 per thousand feet. This amounts to between \$200 and \$358, or \$280 per acre on the average for 70-year-old wood, while the cost of raising the crop, including cost of land, taxes, protection, planting, etc., with four per cent interest to the seventieth year, averages \$140 per acre, leaving a net return of \$140 from land valued at five dollars per acre.

It is interesting to note that, under the market conditions in New England, even 35 to 40-year-old wood can be profitably marketed.

**Forestry a**        The one thing that I wish most to emphasize with  
**State**            this discussion is that forestry deals with long time  
**Business**       periods and can only succeed by well laid plans  
carried out persistently through long periods. Such persistency can only or mainly be expected from the State: *forestry is distinctly State business*. But only when it is divorced from politics and administered on business principles under systematic plans does it produce the astonishing results which we have cited.

It is for the Commission to see the distant future and to help inaugurate and make possible such plans, and now is the time to begin.

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